VIBRATION METHOD FOR TRACKING THE RESONANT MODE AND IMPEDANCE OF A MICROWAVE CAVITY, M. Barmatz*, O. Iny, T. Yiin and I. Khan, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA 91109.

We have developed a vibration technique to continuously maintain mode resonance and impedance match between a constant frequency magnetron source and resonant cavity. This method uses a vibrating metal rod to modulate the volume of the cavity that is equivalent to modulating an adjustable plunger, A similar vibrating metal rod attached to a stub tuner modulates the waveguide volume between the source and cavity. A phase sensitive detection scheme determines the optimum position of the adjustable plunger and stub tuner. The improved power transfer during the heating of a 99.8% pure alumina rod was demonstrated using this new technique, Temperature-time and reflected power-time plots will be presented for the cases of no tracking, impedance tracker only, mode tracker only and simultaneous impedance and mode tracking. Internal melting of the alumina rod near 2000°C with both trackers on will also be discussed.
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